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** Preliminary Version **

Abstract

The YouTube platform reduces fixed entry costs for local artists but also lowers the cost of access to international superstars. The net effect is an empirical question. We study the effect of YouTube on the market for music, focusing on converging tastes for international hits. We consider Austria and Germany, which share a common culture and technological development but differ in access to music videos on YouTube. Exploiting a contract dispute that has blocked official music videos in Germany since 2009, we find that YouTube increases the number of US hits on European charts. We further find evidence that YouTube speeds the hit-making cycle and brings more unique titles to top charts. Although the superstar effect dominates, the magnitude of estimated effects are modest, suggesting that YouTube will not drive out the market for local music.

Keywords: Digitization, Cultural Trade, Music Videos

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1 Introduction

The internet is both a local and a global platform. Nowhere is this dichotomy more pronounced than on YouTube. With a billion unique users accessing more than 6 billion hours of video each month, 80% outside of YouTube's US home, the potential for joint consumption of cultural products has never been higher.

But at the same time, dizzying global statistics hide a local force. YouTube has dramatically lowered the cost of sharing culture on a small scale. Viewing is highly concentrated among top videos, and the vast majority of uploads receive very few views.[1] In economic terms, lower entry costs for niche works interact with lower distribution costs for popular content. The cultural impact of YouTube depends on balance of these two forces.

We are interested in the role of YouTube on cultural convergence, focusing on the market for recorded music. In other words, we ask whether lower costs of cultural exchange lead to more similarities or differences across countries than were present before the YouTube decade. We study music for two reasons. First, music has long been considered an important element of cultural exchange and thus a focus of cultural policy. More practically, about 40% of YouTube videos are music or entertainment related, which makes music the most likely source of convergence (Cheng et al., 2008).

The context for our analysis is Western Europe and the US, focusing on Germany and Austria. We study the European market because of long-standing policy interest in preserving cultural heritage through activist trade policies, especially against US influence. We choose to study Germany because a long-standing legal dispute has kept official music videos off of YouTube through a critical period in the platform's history. YouTube has not been restricted in Austria. Because of a deep history of

[1] In 2011, the media widely covered a YouTube blog post indicating that the top 30% of videos received 99% of total viewing. Coverage here: `http://www.telegraph.co.uk/technology/news/8464418/Almost-all-YouTube-views-come-from-just-30-of-films.html`; original blog post at `http://youtube-global.blogspot.com/2011/04/mmm-mmm-good-youtube-videos-now-served.html`.

shared culture and language plus similar economic and technological status, Austria offers a useful quasi-experimental comparison to aid identification in our analysis.

We find evidence that YouTube simultaneously promotes independent local artists and also global popular music. In our analysis, the global effect dominates, with YouTube bringing more titles, more imported music, and a faster music cycle. We also find evidence of greater overlap between domestic and US popular music charts in the YouTube era. The economic significance of the effects are modest, however, and we find little evidence that international music will displace local culture through the internet.

Our paper contributes to three research areas associated with the economics of digitization. Our findings contribute to work on geography and the internet, especially the study of technology as a complement or substitute for urban agglomeration. Unlike results in Gaspar and Glaeser (1998) on the telephone and Sinai and Waldfogel (2004) on internet retail, we find that YouTube displaces more than promotes local culture.

In studying the spread of niche versus superstar products, our work naturally links to research on consumption of differentiated products and the "long tail." Research in this vein often takes a marketing perspective, since the choice to supply a deep inventory of niche products versus a smaller line of blockbusters is an important strategy choice for firms in the market for books, movies and music (Brynjolfsson et al., 2011). A newer literature tackles the welfare consequences of lower fixed costs and the long tail generated by new supply (Aguiar and Waldfogel, 2014a,b). Our results complement existing work by highlighting the role of technology in the spread of blockbuster products relative to creation of new work.

At a more granular level, we contribute to a literature on the music industry in the digital era. Our paper is closely related to Ferreira and Waldfogel (2013), a broad study of whether technology and trade in the second half of the twentieth century crowded out local music artists and local culture. Ferreira and Waldfogel's results

suggest a persistent and growing taste for domestic music in the digital age as well as stable export shares in proportion to GDP. We find a stronger globalization trend in the YouTube era, which had barely launched in 2007 when Ferreira and Waldfogel (2013) ends.

Finally, our results complement contemporaneous studies on YouTube itself, specifically its role in cannibalizing sales of recorded music. Kretschmer and Peukert (2014) look at digital song and album sales dynamics using variation from the contract dispute that kept official videos off of German YouTube. Hiller and Kim (2014) study album sales in the US during a similar dispute between YouTube and Warner in 2009. The two studies produce opposite results: YouTube videos in Germany complement album sales while reducing them in the US. While our results will shed some light on this question, our focus is less concerned with sales and more focused on converging consumption patterns.

The paper proceeds as follows. Section 2 reviews our data and identification strategy. Section 3 presents results. The final section concludes the paper.

2 Data and Identification

2.1 Data Sources

The basic data for our study of convergence is popular music "Top 100" single charts for the US and Europe, i.e. we focus on songs that reach the top of the popular music charts each year. The resulting rather low number of titles is a limitation of our analysis. However listening data suggest that top songs account for a high share of music listening. Last.fm, a service that tracks music plays of some 90 million users, indicates that the top 100 of the top 1000 artists account for more than 50% of total listening.[2]

[2] See `http://www.last.fm/bestof/2011/artists`.

Table 1: Sample Statistics

	N	Mean	SD	5%	50%	95%
DE-AT Title Overlap	1,370	49.61	4.50	42	50	57
DE-US Title Overlap	1,370	14.78	4.32	8	14	22
US-AT Title Overlap	1,378	14.70	4.13	8	15	22
DE-AT Artist Overlap	1,370	46.80	3.93	40	47	53
DE-US Artist Overlap	1,370	15.31	3.79	9	15	22
US-AT Song Overlap	1,378	15.21	3.71	9	15	21
Unique Titles DE	13	545.77	43.93	464	550	617
Unique Titles AT	13	446.38	43.59	407	440	549
Unique Titles US	13	357.69	39.57	317	355	428
Unique Titles DE (Non-Imports)	13	446.85	49.97	357	453	526
Unique Titles AT (Non-Imports)	13	354.69	32.27	318	350	422
Unique Artists DE	13	370.69	34.34	309	383	411
Unique Artists AT	13	299.69	27.77	262	292	366
Unique Artists US	13	211.54	16.43	179	212	240
Unique Artists DE (Non-Imports)	13	302.31	32.93	248	310	346
Unique Artists AT (Non-Imports)	13	237.92	22.28	206	233	290

Source: Top 100/75 single charts. US=United States, DE=Germany, AT=Austria.

In most of our analyses we focus on Germany (DE) and Austria (AT) to aid identification of YouTube effects. Our primary dependent variable is a measure of overlap in the popular charts across countries from 2002–2013. We also examine other measures of the music trade, including the domestic share of popular songs in the top charts each year, the number of unique songs appearing among the top hits, and the speed of diffusion new music. Chart data for Germany and Austria comes from charts.de, the official website of GfK Entertainment, the organization which collects sales for the German industry association Bundesverband der Musikindustrie. GfK reportedly covers 90% of all brick-and-mortar retail, online retail, and digital distribution channels in Germany. Data for the US is taken from billboard.com, the dominant and standard source for music sales data. Austrian charts list only the 75 top weekly sellers, so we restrict our sample to this level.

Table 1 summarizes the primary dependent variables in our study. The top portion of the table summaries overlap in the top 75 charts in each of 688 weeks from 2001–2013 in terms of both song titles and artists. Overlap between Germany and Austria averages about 50 titles and 47 artists, with a rather narrow range (standard deviation of 4.5). The number of unique titles and artists is shown in the second and third panel. Variety on average is higher in Germany than other countries both in terms of all songs and also songs that do not appear on US top charts (which we call non-imports).

2.2 Experimental Setting

We identify the effects of YouTube on the market for music by exploiting a contract dispute with the German rights management agency GEMA (Gesellschaft für musikalische Aufführungs- und mechanische Vervielfältigungsrechte, society for musical performing and mechanical reproduction rights) that kept official music videos off of YouTube in Germany starting in April 2009. The history and nature of the dispute between YouTube and GEMA has been well-covered in music news and in the economic literature.[3] The data journalism site OpenDataCity reports that of the top 1000 most viewed videos worldwide, more than 60% are not accessible within Germany, while only 0.9% are blocked in the US.[4] Out of these top 1000 videos, 612 are music clips, of which 585 (96%) are not available in Germany. YouTube is simply not the hub for global music and music culture in Germany that it has elsewhere become.

We support the validity of our experimental setting with some information on supply and demand for music videos on YouTube in Germany relative to Austria and the US. We work with a random selection of 950 songs released as singles three years before and three years after the YouTube ban, 2006-2011. The list of songs is compiled using the online platform MusicBrainz, which offers user-generated meta-information

[3] See, for example, `http://www.ft.com/intl/cms/s/0/5bb2092e-117e-11e3-a14c-00144feabdc0.html#axzz3C9p8fdZK` and also (Kretschmer and Peukert, 2014)

[4] See `http://apps.opendatacity.de/gema-vs-youtube/en`.

Table 2: Supply and Demand for Music on YouTube

	US	Austria	Germany
Relevance Share			
Page 1	0.78	0.77	0.75
Page 2-4	0.75	0.74	0.74
Page 5-25	0.71	0.71	0.72
Official Video Share			
Page 1	0.09	0.09	0.05
Page 2-4	0.02	0.02	0.02
Page 5-25	0.02	0.02	0.02
Viewing Share			
Page 1	0.83	0.82	0.75
Page 2-4	0.04	0.05	0.07
Page 5-25	0.01	0.01	0.01

Note: Individual searches for songs on US, Austrian and German YouTube, based on a list of songs compiled from Musicbrainz.

on a total of 1.3 million releases in over 60 countries from the 1950s until recently. Using YouTube's application programming interface (API), we collect search results on German, Austrian and US YouTube from "Artist – Song" searches for each song. Based on 500 (25 pages) search results for each title, we calculate a relevancy score based on the share of results that include both the artist name and at least three words of the song title. We characterize both front-page and aggregate search results. Note that although we consider titles released from 2006–2011, search can be conducted only at a single point in time (our data is from August, 21, 2014).

Table 2 summarizes relevancy scores and official video counts on US, Austrian and German YouTube. The first row shows measures for the first search page, the second row for pages 2-4, then the third row for remaining 20 pages. Overall, about 75% of front-page search results meet our relevancy criterion. Front-page search results in Germany are less relevant than in the US by 3 percentage points. The number of official videos in German is also about 4 percentage points lower than in the US. Austrian first page results look more similar to the US. Standard errors (not shown) on the shares are very small, indicating significant differences.

This difference in supply has implications for viewing. When we summarize views of all videos in the search results that meet the relevancy criterion, we find a highly skewed distribution toward the first page, with more than 80% of total views on the first results page, about 10% on the second page, 5% on page three, and the remaining 5% in later pages. The lower panel of table 2 indicates that the share of views on the front page is substantially lower in Germany than in the US or Austria by about 6 percentage points. Taken together, all of these measures suggest that the process of finding and experiencing music videos on YouTube is fundamentally different in Germany than in the US or Austria.

We continue in the next section by analyzing the consequences of that difference. If YouTube influences musical tastes, we would expect consumption patterns between the culturally similar Germany and Austria to diverge after the German YouTube ban. We study this divergence using overlap in the weekly top charts across the two countries. We further expect that any changes in the dynamics of the music cycle induced by YouTube to be most evident in comparison with the Austrian market.

3 Results

3.1 Descriptive Evidence

Before turning to our econometric analysis, we present a few simple illustrations of the music market in Germany, Austria and the US. Figure 1 illustrates the overlap in the popular music sales charts since 2002 between the United States, Germany and Austria. The bottom line shows the number of titles on the top 75 song list each week that appear on both the US and German charts. The top line shows the corresponding number for Germany and Austria. The circles and squares represent weekly overlap, and the solid lines connect weekly medians. The vertical line marks the point in April 2009 when music videos were blocked on German YouTube. Figure 2 repeats the

Figure 1: Song Overlap: US & Germany, Austria & Germany

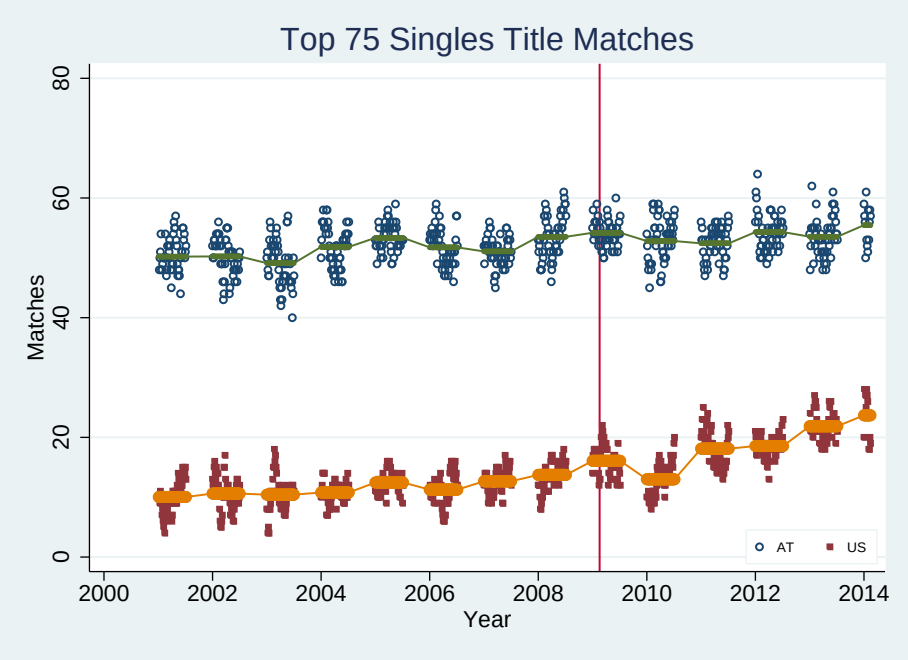


Figure 2: Artist Overlap: US & Germany, Austria & Germany

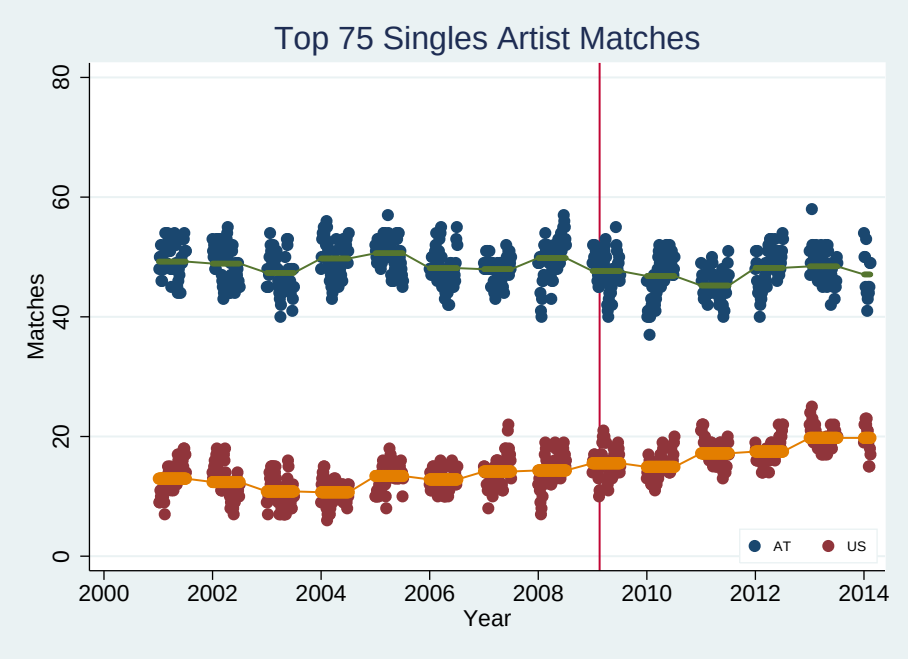


illustration at the artist level.

The two panels illustrate some relevant facts about music markets. Overlap of the most popular songs between Germany and the US is lower than might be expected, exceeding 1/3 in only a handful of weeks and averaging below 20% through most of the study period. Overlap among German and Austrian charts is much higher, above 2/3 in most weeks. The link of culture and language is clearly evident in the figure.

A time trend is also visible in the figures. Overlap between German and US charts begins to increase about 2005 at the start of the YouTube era, accelerating in more recent years. The figures show less evidence of convergence with Austrian charts. A sharp drop in overlap between the US and German charts is evident at the time of the 2009 blockade in Figure 1, before rising again (steeply) in more recent years. A slight decrease can be seen in the Austrian data. The artist pattern is less visually distinct.

We can also investigate the diffusion of cultural products by studying differences in the appearance date of top songs on popular charts across countries. Figure 3 plots the number of weeks difference between chart appearance in Germany and Austria compared to the US for singles that appear on all three (German, Austrian and US) charts. Of the 9,208 titles appearing on the charts, about 10% (909) appear in all three countries. We restrict the sample to titles appearing within a year (52 weeks) of the US release, which produces a sample of 835 titles. German and Austrian appearances track each other very closely, as shown by the median lag on the scatterplot. Plotting the median shows a gap appearing in 2010 and persisting until 2013, when a large number of official music videos became available in Germany outside YouTube on Universal and Sony's own platform VEVO[5].

An illustration of survival time on charts is less illuminating. Again focusing on song titles that appear on the top charts in all three countries, we examine the number of weeks each song spends on the charts. We restrict attention to years 2002–2012,

[5]See http://thenextweb.com/media/2013/10/01/music-video-site-vevo-launches-in-germany/

Figure 3: Weeks Between Chart Appearance Relative to US

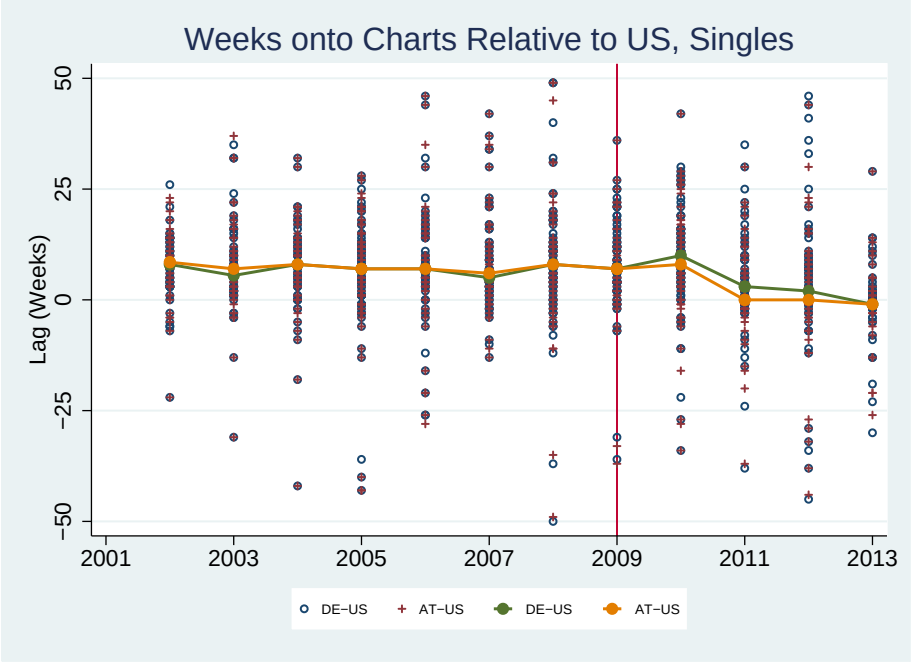
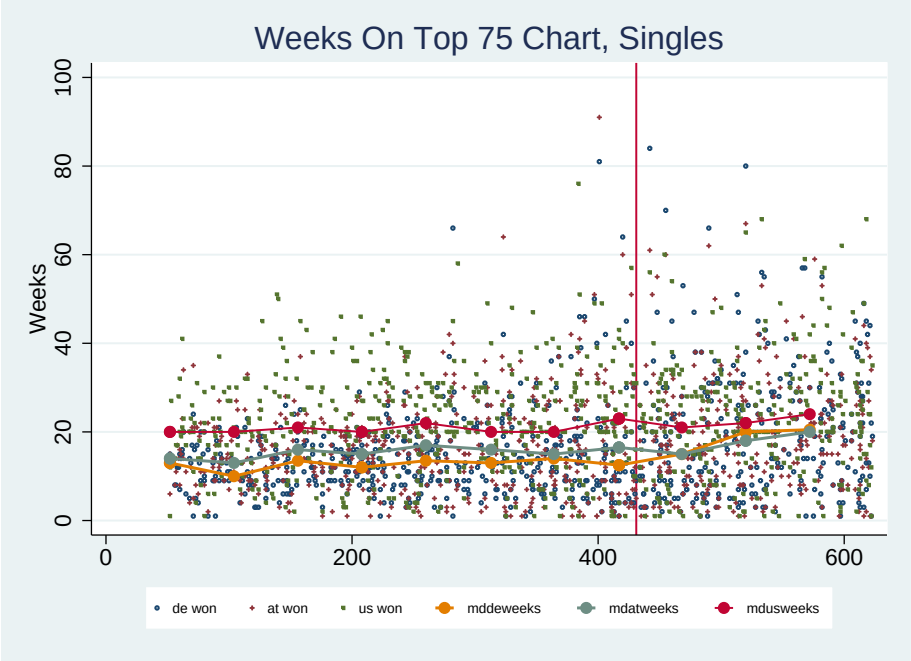


Figure 4: Weeks on Charts: US & Germany, Austria & Germany



since some songs that made the charts in 2013 remain in place. Results are shown in figure 4. The distribution of running times shows wide variation. The average time on charts in both Germany and Austria is less than the US, averaging about 16 rather than 21 weeks. The figure suggests that median times are increasing in Germany relative to Austria at the time of the YouTube ban. Taken together we interpret the patterns in figure 3 and 4 as evidence that YouTube affects the life cycle of popular music, bringing hits faster for shorter periods.

As a final illustration of the patterns in the data, we study imported music directly, looking more deeply at the convergence in figures 1 and 2. Figures 5 and 6 show the number of singles and artists on the Top 75 charts each year that are shared with the US and those that come from domestic markets in either Austria or Germany (i.e. do not appear on the US charts). Both pictures reveal that a dominant trend since digitization has been the decrease in domestic songs and artists on the German charts, which has dropped in Germany in a more pronounced fashion than imports have increased. The pattern in Austria is quite different – both the number of songs and artists from the US has increased over time. The pattern is clearly related to an overall trend, which seems to have accelerated after the YouTube ban.

Figure 5: Imported Music, Songs

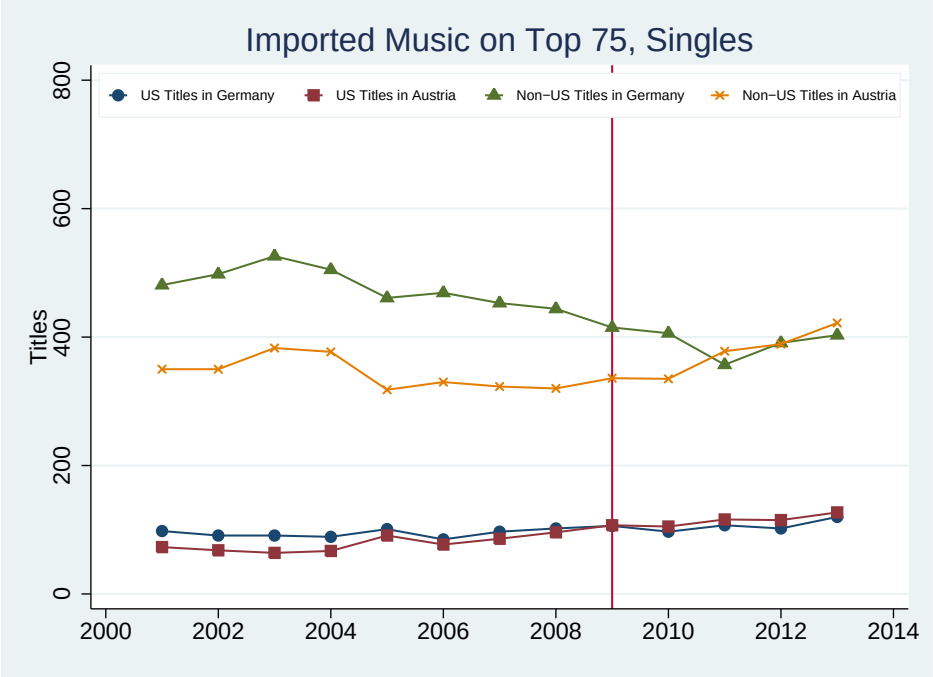


Figure 6: Imported Music, Artists

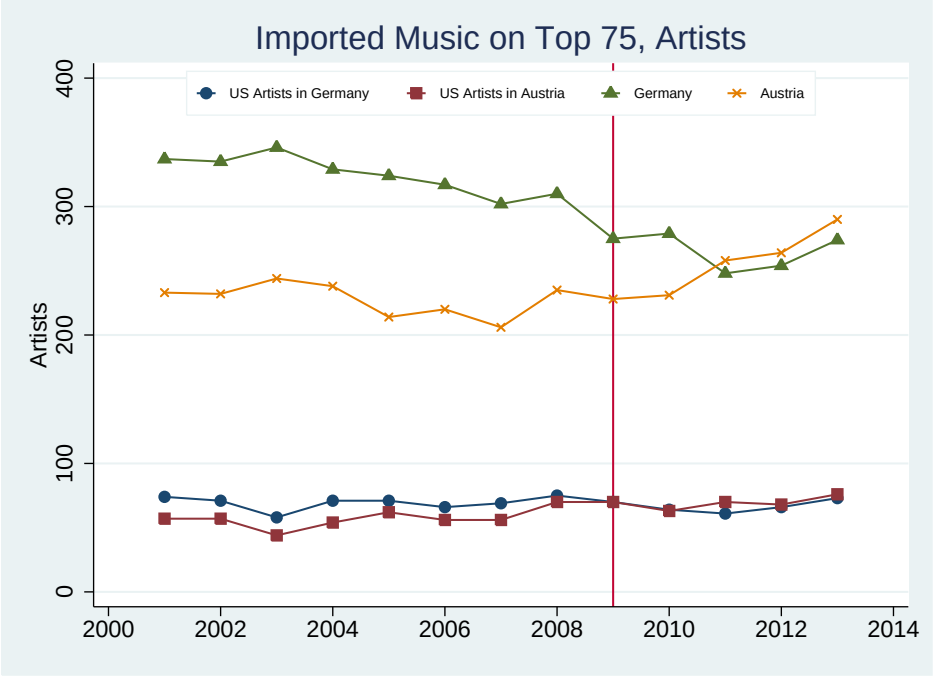


Table 3: Austria-Germany-US Song and Artist Chart Matches

	Song Overlap			Artist Overlap		
	DE-US	AT-US	DE-AT	DE-US	AT-US	DE-AT
	(1)	(2)	(3)	(4)	(5)	(6)
GEMA	–9.635**	–3.008*	1.472	–4.193**	–.437	–6.794**
	(1.263)	(1.306)	(1.509)	(1.127)	(1.152)	(1.514)
Weekly Trend	.012**	.018**	.010**	.010**	.015**	.001
	(.001)	(.001)	(.002)	(.001)	(.001)	(.002)
Trend*GEMA	.023**	.008**	–.006+	.011**	.001	.009**
	(.003)	(.003)	(.003)	(.002)	(.003)	(.003)
Constant	9.684**	8.825**	49.852**	10.826**	9.808**	48.734**
	(.280)	(.288)	(.335)	(.250)	(.254)	(.336)
Mean Overlap	14.8	14.7	49.6	15.3	15.2	46.8
N (Weeks)	621	624	621	621	624	621
Adj. R2	.605	.620	.112	.514	.572	.080

Dependent variable is the number of song/artist matches on the top 75 singles charts across countries: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

3.2 Regression Results

In this section we more precisely estimate the effects suggested in the figures above. We first estimate how the overlap in top charts across countries changes after the Youtube ban. To do this, we regress the number of song and artist matches on the top 75 singles charts across Germany, Austria and the US each week from 2002 through 2013. We estimate a discontinuity at the start of the ban and also an effect of the ban on a (weekly) time trend. In the tables and analyses that follow, we indicate the blockade with the variable GEMA.

Results are reported in table 3. The first two columns in table 3 show the number of overlapping songs on the top 75 charts between Germany and the US, then Austria and the US. Columns (4) and (5) repeat the analysis for artists. Means of the independent variable in all four columns indicate an overlap of about 15 songs and artists from the top 75 in both Austria and Germany relative to the US. Removing access to official music videos on YouTube reduced the overlap in Germany substantially, by 9.6

songs and 4.2 artists, or about two thirds and one third, respectively. The coefficient on the time trend is positive but small in magnitude, indicating that an underlying convergence trend speeds up enough after the ban to close the title gap after about 8 years (416 weeks), somewhat less for the artist gap. In column (2) the German ban is associated with reduced overlap in Austria as well as Germany, but the magnitude is only one third the size of the German effect. Results in column (5) show no effect of the GEMA ban on artist overlap between Austria and the US.

We can exploit our identification strategy more directly by studying overlap trends between Germany and Austria, shown in columns (3) and (6). Overall, as suggested by figures 1 and 2, overlap in songs and artists on top charts is much higher between Germany and Austria than between either country and the US, averaging 50 songs or 2/3 of the weekly charts. In terms of songs, the GEMA ban has no statistically significant effect on overlap in levels, but the negative interaction term in column (3) indicates divergence in the charts over time. The magnitude of the divergence is small, indicating that a YouTube ban lasting 10 years would reduce overlap between the countries by only 3 songs, or fewer than two songs, or 6% of the gap. The results for artists in column (6) indicates a substantial drop in artist overlap at the time of the ban, about 7 songs on an average of 47. The interaction term is positive, suggesting faster convergence after the ban, but the magnitude is very small and would close the initial gap only after almost 15 years.

We conclude from the results above that free and open access to music videos on YouTube has contributed to the steady increase in US music on European top charts. The magnitude of the YouTube effect is modest relative to other forces of convergence in digital music. With this evidence, it is useful to consider underlying mechanisms for convergence, or more broadly other ways in which YouTube has altered the music market. One candidate is timing. Since the dawn of MTV, video has been accused of

Table 4: Difference in Weeks Onto and On Top Charts, Germany-Austria

	Time Onto Chart		Survival Time	
	(1)	(2)	(3)	(4)
GEMA	.873	–3.567	2.278**	–3.201
	(1.403)	(6.159)	(.713)	(3.126)
Weekly Trend	.005	.004	.001	.000
	(.004)	(.004)	(.002)	(.002)
Trend*GEMA		.009		.012+
		(.013)		(.006)
Constant	–1.585+	–1.418	–2.292**	–2.086**
	(.870)	(.899)	(.443)	(.457)
Mean Difference	.239	.239	–.880	–.880
N	835	835	835	835
Adj. R2	.010	.009	.042	.045

Dependent variable is the number of artist matches on the top 75 singles charts across countries: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

accelerating the music cycle and favoring "disposable" music.[6] We can study YouTube's effect on the dynamics of the music cycle with our chart data by regressing the difference between the appearance of a song on the Austrian charts relative to German charts before and after the YouTube music video ban. An analogous regression of survival time on charts is also informative.

Results of the dynamic analysis are shown in table 4. The first two columns show the difference between Austria and German in the first appearance of a song on the top charts. The third and fourth columns show the difference between the countries in survival time on the top charts. The sample is restricted to the 835 songs that ultimately appear on all three country's top charts.

The coefficients in the first two columns of the table are not significantly different from zero and the overall regression has little explanatory power. This, combined with the observation that the average difference in weeks onto the charts across countries is small, indicates that that YouTube does not likely play a role in speeding the hit-making

[6]See, for example, the PBS documentary in celebrating 20 years of MTV, transcript here: `http://www.pbs.org/wgbh/pages/frontline/shows/music/perfect/mtv.html`.

Table 5: Annual Unique Songs and Artists (US, DE, AT)

	Unique Songs		Unique Artists	
	(1)	(2)	(3)	(4)
GEMA	49.788*	26.662	–17.937	–28.625
	(22.750)	(30.531)	(13.124)	(17.156)
Yearly Time Trend	.067	3.625	–.125	1.519
	(2.360)	(3.970)	(1.361)	(2.231)
DE	235.500**	270.365**	175.625**	196.524**
	(14.736)	(24.310)	(8.501)	(13.660)
AT	83.250**	85.740**	66.000**	62.365**
	(14.736)	(24.310)	(8.501)	(13.660)
GEMA*DE	–123.300**	–58.550	–42.825**	–4.012
	(23.761)	(43.177)	(13.708)	(24.262)
GEMA*AT	14.150	18.775	57.600**	50.850*
	(23.761)	(43.177)	(13.708)	(24.262)
DE*T		–9.962+		–5.971+
		(5.614)		(3.155)
AT*T		–.712		1.038
		(5.614)		(3.155)
Constant	338.139**	325.687**	219.187**	213.433**
	(13.296)	(17.190)	(7.670)	(9.659)
Mean Y	460.603	460.603	312.808	312.808
N	39	39	39	39
Adj. R2	.888	.894	.943	.949

Dependent variable is the number of unique songs or artists each year on the top 75 singles charts in the US, Germany and Austria. + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

process. However there is evidence in the survival analysis in columns (3) and (4) that after the YouTube ban, songs on the German charts remain there longer. Results in column (3) indicate an effect on the average while results in column (4) suggest the effect operates through a time trend. The overall indication is that access to YouTube hastens departure and increases turnover in top charts.

Our final test considers a measure of YouTube's effect on the number of unique songs and unique artists that appear on the top charts each year. This analysis is related to dynamics in the sense that fewer unique titles on a fixed-size chart suggests longevity and vice versa. However the annual aggregates offer a broader view of variety.

Table 6: Annual Unique Songs and Artists (Domestic Songs), DE–AT

	Unique Songs		Unique Artists	
	(1)	(2)	(3)	(4)
GEMA	45.437	–222.000**	22.225	–138.567**
	(28.459)	(60.898)	(18.041)	(41.461)
Yearly Time Trend	2.913	–2.964	2.558	–.976
	(3.700)	(2.884)	(2.346)	(1.963)
DE	184.625**	168.833**	134.159**	123.917**
	(22.660)	(17.061)	(14.365)	(11.616)
GEMA*DE	–77.325+	127.967	–54.862*	78.283
	(40.247)	(86.122)	(25.514)	(58.635)
DE*T	–9.250+	–4.738	–7.010*	–4.083
	(5.233)	(4.078)	(3.317)	(2.777)
GEMA*T		30.564**		18.376**
		(6.576)		(4.477)
GEMA*T*DE		–23.462*		–15.217*
		(9.300)		(6.332)
Constant	411.428**	432.000**	275.798**	288.167**
	(16.023)	(12.064)	(10.157)	(8.214)
Mean Y	460.603	460.603	312.808	312.808
N	26	26	26	26
Adj. R2	.838	.921	.873	.928

Dependent variable is the number of unique songs or artists each year on the top 75 singles charts in Germany and Austria. See text for details. + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

In these tables it is also more convenient to study the full sample of songs rather than the international hits.

Table 5 and 6 report results. The first two columns of table 5 show the effect of the YouTube ban on the number of unique titles on the charts each year in Germany and Austria relative to the US. Columns (3) and (4) repeat the analysis for unique artists. The first specification includes a common time trend, the second a country-specific time trend. The GEMA coefficient in the first row is positive, and likely captures unobserved baseline effects of digitization after 2009. The key coefficients in this table are the GEMA-DE and GEMA-AT interactions terms. The negative interaction term in columns (1) and (3) suggest that the GEMA ban appears to have reduced variety

Table 7: Annual Unique Songs and Artists (Domestic Songs), DE–AT

	Unique Songs		Unique Artists	
	(1)	(2)	(3)	(4)
GEMA	35.063	–221.333**	20.075	–139.383**
	(28.929)	(67.045)	(16.619)	(35.352)
Yearly Time Trend	–1.067	–6.702*	.981	–2.524
	(3.761)	(3.175)	(2.161)	(1.674)
DE	158.163**	141.417**	117.510**	107.000**
	(23.034)	(18.784)	(13.233)	(9.905)
GEMA*DE	–71.725+	145.983	–47.825+	88.800+
	(40.911)	(94.817)	(23.503)	(49.996)
DE*T	–6.404	–1.619	–5.788+	–2.786
	(5.319)	(4.490)	(3.056)	(2.368)
GEMA*T		29.302**		18.224**
		(7.240)		(3.818)
GEMA*T*DE		–24.881*		–15.614**
		(10.239)		(5.399)
Constant	347.611**	367.333**	224.317**	236.583**
	(16.287)	(13.282)	(9.357)	(7.004)
Mean Y	327.500	327.500	226.679	226.679
N	26	26	26	26
Adj. R2	.812	.892	.868	.936

Dependent variable is the number of unique songs or artists each year on the top 75 singles charts in Germany and Austria in a sample that excludes imports (titles and artists appearing on US charts). See text for details. + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$.

on top charts in Germany, however the coefficient estimate is not robust to inclusion of country-specific time trends. To focus more closely on our identification strategy in comparing Germany and Austria, table 6 reports results for these two countries with a full set of trend interactions. Columns (1) and (3) include a country-specific time trend, and show a negative and statistically significant (10% level) estimate for the effect of the YouTube ban in Germany relative to Austria. Columns (2) and (4) include a country-specific kinked time trend. The negative sign on the three-way interaction suggests again that banning official music videos on YouTube reduces the number of unique titles and artists that make it to the top charts.

It is worth noting that the yearly aggregates in tables 5 and 6 include all titles.

The pattern of results with a sample limited to German and Austrian titles (i.e., songs that do not hit the US charts) show substantively similar results (table 7).

4 Conclusions and Implications

The YouTube platform reduces fixed entry costs for local artists but also lowers the cost of access to international superstars. The net effect is an empirical question. Exploiting a contract dispute that has blocked official music videos in Germany but not Austria since 2009, we find that YouTube increases the number of US hits on European charts and speeds the hit cycle in the market for popular music. Although we find that the net impact of the YouTube platform is to widen the reach of international hits, the magnitude of estimated effects are modest, suggesting that YouTube will not drive out the market for local artists.

It is worth stressing that we look only at the top 75 songs each week across countries during the study period. These top songs are important because they constitute a large fraction of music sales and music listening. But a trend away from domestic music on the top charts does not mean fewer domestic songs are available or played in aggregate. We do not observe the long tail of independent music and cannot comment on divergence at a more granular level. This is an exciting avenue for future research.

Because we do not observe YouTube viewing, we focus on positive rather than normative effects. However from a welfare standpoint, faster turnover on popular charts and the spread of international superstars can be seen as beneficial developments that increase variety and quality at any time in a market. This is often not the policy view, but perhaps it should be.

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